Build Your Dreams

BYD Energy Storage System

Efficient, Stable and Safe Storage Solutions for Renewable Energy.

BYD Green Dreams

BYD Energy Storage Solutions

Relying on the advanced Fe battery technology, BYD can provide large-scale energy storage systems, distributed energy storage systems and micro-grid systems. Based on these systems, BYD can provide a complete power solution realizing power output smoothing, peaking shaving, frequency regulation, transient active power responding and transient voltage supporting, to keep the power system running safely, stalely and reliably. These solutions can be used for frequency regulation, voltage compensation, frequency regulation and power quality management in the power system.

BYD mainly provide Indoor/outdoor two kinds of solutions for on grid using, off grid using and hybrid using. Benefiting from the flexible and modular design, BYD ESS can be fit for various needs. From 2009 to 2013, BYD have finished a lot of successful cases from KW sized to MW sized system on china mainland or abroad.

ESS Application Fields

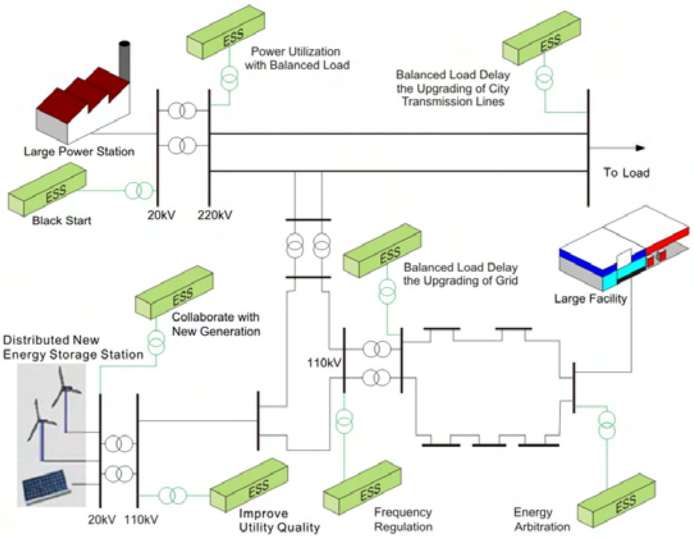
- New-energy generation

Effectively smoothen the power output to decrease the impact to grid
Generate according to the plan and correct forecast errors
Reduce the peak and fill the valley
Grid frequency modulation with AVC and AGC functions

- Electricity of transmission and distribution
- Smart grid
- Micro-grid
- Reduce the peak and fill the valley

- Special type needs

Military base, smelter, chemical plant, paper mill, airport, wharf and others


ESS
Power Utilization with Balanced Load
ESS
Balanced Load Delay the Upgrading of City Transmission Lines
Large Power Station
To Load
ESS
Black Start
20kV
220kV
ESS
Balanced Load Delay the Upgrading of Grid
Large Facility
ESS
Collaborate with New Generation
Distributed New Energy Storage Station
110kV
ESS
Improve Utility Quality
ESS
Frequency Regulation
Energy Arbitration
ESS
20kV
110kV

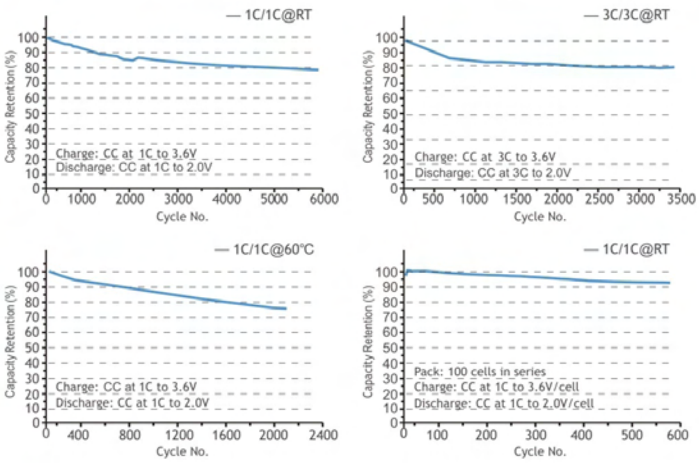
Energy Sources Storage

Battery

The high efficiency of BYD energy storage system is ensured by the advanced Fe battery technology and the intelligent Battery Management System. BYD self-developed Fe battery is environment al friendly and has excellent safety performance. Special designed for the BYD battery, the unique technology of BYD BMS can give smart control and protection to the system.

- Long service life
- High power and high efficiency out put
- Low cost and full automatic manufacture process
- High safety

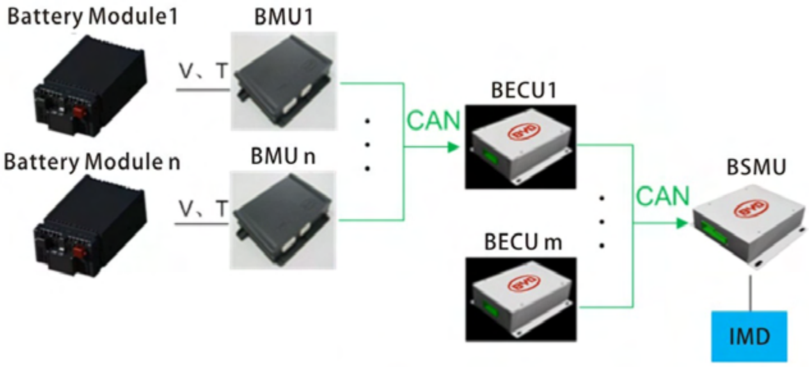
BYD Lithium-ion Iron-Phosphate (Fe) Battery Module Life Cycle Tests



Features of BMS

- Battery status monitoring
- Events record and storage function
- Operation control
- Insulation detection
- Dynamic balancing management
- Protection alarms
- Communication

BMU : Battery Management Unit
BECU : Battery Electric Controller Unit
BSMU : Batter System Management Unit



Features of PCS

- Wide-range of DC input voltage
- 10% additional power for continuous operation at ambient temperature up to 40℃
- Short conversion time of full power from charge to discharge
- Indoor or outdoor installation
- Low voltage ride through
- Reactive power adjustable, max. reactive power up to 500kVar
- Active power derating
- Film capacitor design

Fire Protection system

- Automatic fire detecting
- Manual/automatic fire alarming
- Control room and local fire alarm device
- Fault alarm for fire detecting and alarming system
- The accumulator is placed in fire alarming controller. When the main power is off, the accumulator will supply the power to the automatic fire alarming system
- The monitoring function for the open circuit and short circuit in detecting circuit
- The monitoring function for the open circuit and short circuit in alarming circuit

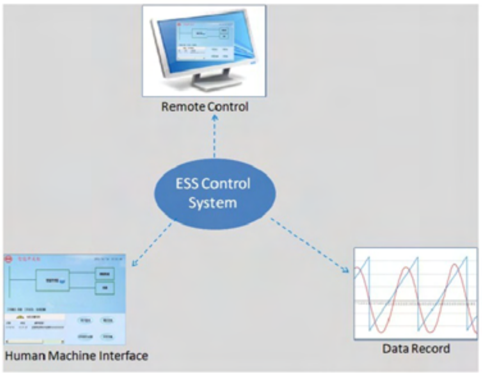
Air Condition System

- Power-off memory And Reboot
- Remote fault identification and alarm, and report the fault through RS485
- Use the fuzzy intelligence control for remote communication
- Have the cooling, heating, constant temperature and dehumidifying mode
- Heating control
- Temperature control
- Operation without failure continuous more than 2500hours, Long life, good working performance in harsh environment

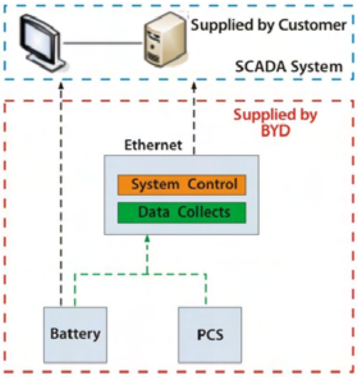
Monitoring System

Energy Storage Control System Function

- Controlling PCS and battery stacks to work together
- Providing local monitoring and control operation interface
- Providing remote monitoring and control operation interface
- Recording and storing important operation parameters as accidents and failure data

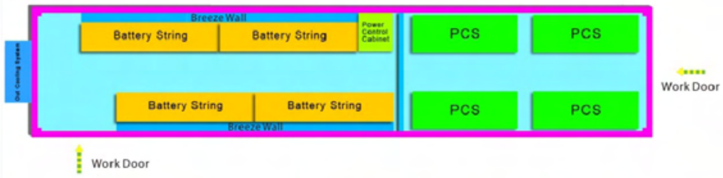


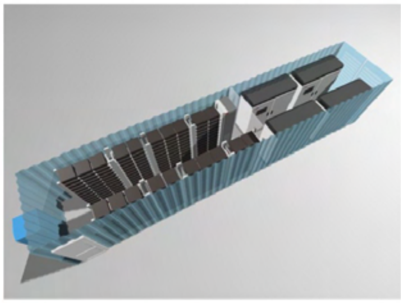
Remote Control



Local Control

Specification





	PCS Power	Battery Capacity	Size
1	250kW	1MWh	40feets Container
2	500kW	1MWh	
3	1MW	1MWh	
4	1.8MW	800kWh	

New Energy Testing Center

BYD New Energy Testing Center was found on 1st Dec. 2009, it mainly focus on testing and certification for New Energy products.

BYD New Energy Testing Center had been authorized by UL, VDE, TUV and CSA. We can test and certificate the products by the testing center.

Certificate of Recognition
for
Shenzhen BYD Auto Company Limited
3001 Hengping Road, Pingshan
518118 Longgang, Shenzhen
China
by
VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute
as
Registered Manufacturer's Laboratory
for

VDE INSTITUT

CERTIFICATE OF PARTICIPATION
issued by
UL-CCIC Company Limited on behalf of
Underwriters Laboratories Inc.

has been assessed and found eligible to participate in
Underwriters Laboratories Inc.
WITNESS TEST DATA PROGRAM

SPECIAL INSPECTION SERVICE

C 2231318

This product is evaluated to the Model Code SPE-1000. Such evaluation does not constitute certification but is an accepted form of approval of electrical products by the authority having jurisdiction.

Ce produit est évalué selon le code modèle SPE-1000. Une telle évaluation ne constitue pas la certification mais est une forme admise d'approbation des produits électriques par l'autorité compétente.

SERVICE D'INSPECTION SPÉCIALE

BYD Project Reference

Canada 4MW/2MWh Containerized ESS

System Parameter

System Capacity: 4MW/2MWh
Project Location: Ontario Canada
Completion Time: April, 2014
Owner: RES Canada

Function

Demonstration Project
Peak Shaving
Peak and Frequency Regulation
Power Storage

USA 4MW/2MWh Containerized ESS

System Parameter

System Capacity: 4MW/2MWh
Project Location: Ohio USA
Completion Time: February, 2014
Owner: RES America

Function

Frequency Regulation

USA 200kW/500kWh Containerized ESS

System Parameter

System Capacity: 200kW/500kWh
Project Location: Louisiana, USA
Completion Time: August, 2012
Owner: Duke, USA

Function

New Energy Testing
Solar Output Smoothing
Voltage / Frequency Regulation

USA 2MW/4MWh Containerized ESS

System Parameter

System Capacity: 2MW/4MWh
Project Location: San Francisco, USA
Completion Time: September, 2011
Owner: Chevron USA

Function

Used in Micro-grid System
Solar Output Smoothing
Power Loads

Italy 1MWh Containerized ESS

System Parameter

System Capacity: 1MWh
Project Location: Italy
Completion Time: April, 2014
Owner: Terna

Function

Frequency Regulation

Chevron 250kW/500kWh Containerized ESS

System Parameter

System Capacity: 250kW/500kWh
Project Location: Doha Qatar
Completion Time: November, 2012
Owner: Chevron USA

Function

Solar Power Testing
Energy Storage
Solar Output Smoothing
Working On / Off Grid

BYD 200kW/800kWh Containerized ESS

System Parameter

System Capacity: 200kW/800kWh
Project Location: Shenzhen, China
Completion Time: June, 2009
Owner: BYD

Function

Peak Shaving
Power Loads

Ali Tibet 2MW/5.32MWh ESS

System Parameter

System Capacity: 2MW/5.32MWh
Project Location: Tibet, China
Completion Time: December, 2013
Owner: Longyuan Tibet New Energy Company

Function

Solar and Wind Output Smoothing
Peak Shaving
System Frequency

Build Your Dreams

State Grid 9MW/36MWh ESS

System Parameter

System Capacity: 9MW/36MWh
Project Location: Zhangbei, China
Completion Time: December, 2011
Owner: State Grid

Function

Solar and Wind Output
Smoothing
Peak Shaving
System Frequency

China Southern Power Grid 3MW/12MWh ESS

System Parameter

System Capacity: 3MW/12MWh
Project Location: Shenzhen, China
Completion Time: August, 2011
Owner: China Southern Power Grid

Function

Demonstration Project
Peak Shaving
Peak and Frequency Regulation
Power Storage

BYD 20MW/40MWh ESS

System Parameter

System Capacity: 20MW/40MWh
Project Location: Shenzhen, China
Completion Time: June, 2014
Owner: BYD

Function

System Frequency
Micro Grid

Trial Project of Energy Storage System with High Capacity Batteries of Nuclear Power Station

System Parameter

System Capacity: 2.5MW/3.5MWh
Project Location: Shenzhen, China
Completion Time: Feb.2012
Owner: CGNPC

Function

Emergency Power Supply of
Nuclear Station
Multimachine Parallel Function

State Grid 1MW/1MWh ESS

System Parameter

System Capacity: 1MW/1MWh
Project Location: Zhangbei, China
Completion Time: November, 2010
Owner: State Grid

Function

Wind Output Smoothing

ZhongDian Puri 100kW/400kWh ESS

System Parameter

System Capacity: 100kW/400kWh
Project Location: Zhangbei, China
Completion Time: November, 2011
Owner: ZhongDian Puri

Function

Dual Mode Automatic Seamless
Switch of Grid-tied and Off-grid

About BYD

Established in 1995, BYD is a top high-tech enterprise in China specializing in IT, automobile, and new energy. BYD is the largest supplier of rechargeable batteries in the globe, and has the largest market share for Nickel-cadmium batteries, handset Li-ion batteries, cell-phone chargers and keypads worldwide. It also has the second largest market share for cell-phone shells in the globe. BYD Auto becomes the most innovative independent national auto brand and leads the field of electric vehicles with unique technologies. In the field of new energy, BYD has developed green products such as solar farm, battery energy storage station, electric vehicle, and LED, etc. It will continue to lead the new energy revolution in the world!

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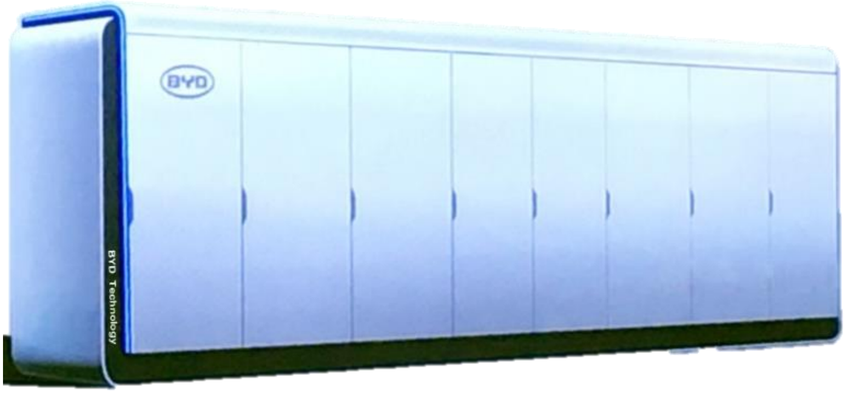
Email:eprisupport@byd.com
Skype:BYDEPRI
Website: www.bydenergy.com

BYD-Cube

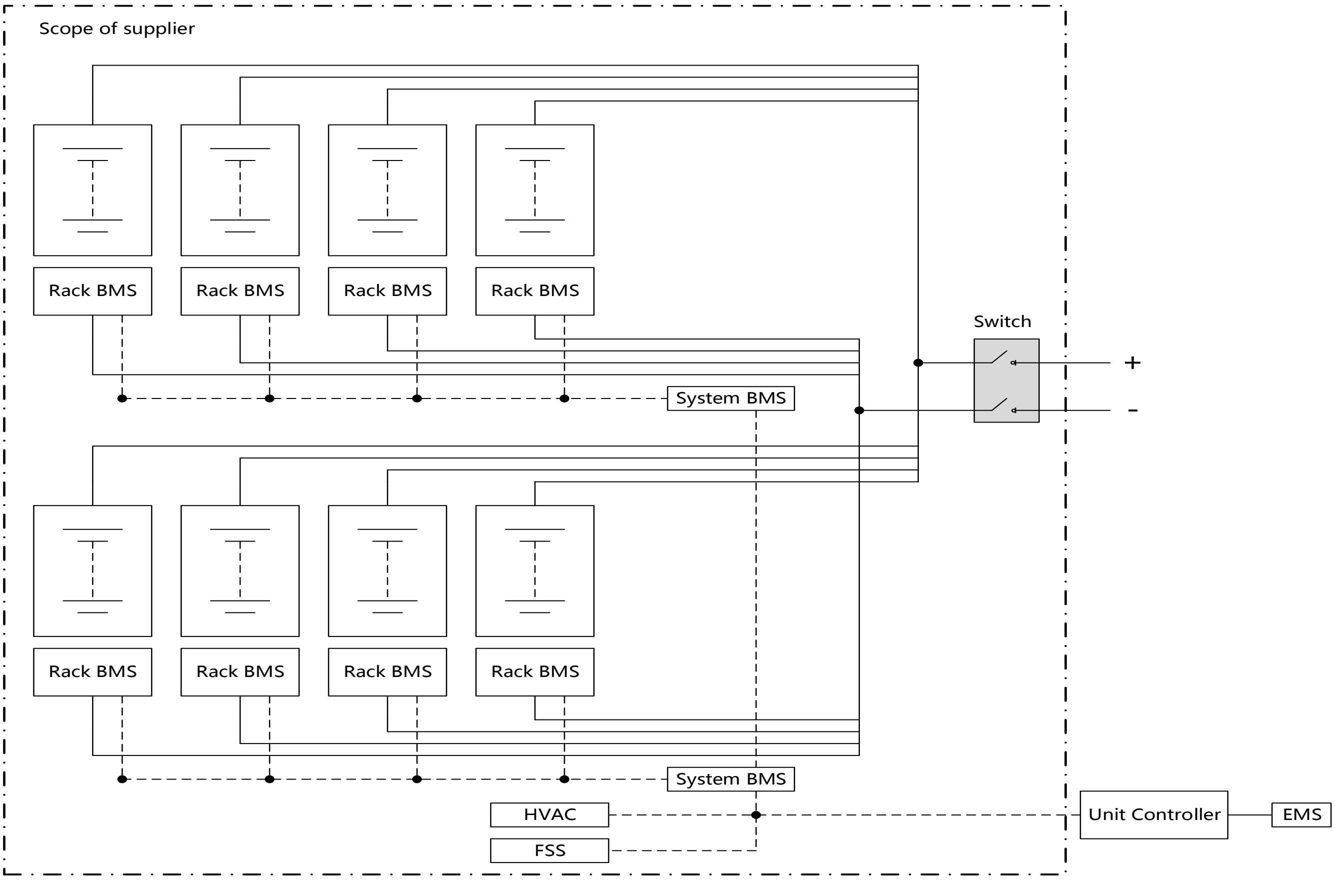
CP32-B2800-U-R1M01 & CP32-B2800-U- R2M01 & CP32-B2800-U- R3M01 & CP32-B2800-U- R4M01



System Features

- Compact mechanical design, minimized footprint
- High efficient system with safe and long lifecycle LFP battery
- Highly integrated system to allow flexible transportation and on-site installation
- ALL IN ONE design, integrated local controller, HVAC and FSS to ensure system safety

Circuit Diagram



System Parameter

System Type	**CP32-B2800-U-R1M01**	**CP32-B2800-U-R2M01**	**CP32-B2800-U-R3M01**	**CP32-B2800-U-R4M01**
DC Side Data				
Cell Type	LFP C15FHNE	LFP C15FHNE	LFP C15FHNE	LFP C15FHNE
Pack Type	1P114S	1P114S	1P114S	1P114S
Battery String Type	1P342S (3 packs)	1P342S (3 packs)	1P342S (3 packs)	1P342S (3 packs)
System Configuration	8 × 1P342S	8 × 1P342S	8 × 1P342S	8 × 1P342S
Battery Capacity (BOL)	2800kWh	2800kWh	2800kWh	2800kWh
DC Usable Energy (BOL)@FAT	2580kWh	2590kWh	2600kWh	2600kWh
DC Energy at Full Power (BOL)@FAT	2450kWh	2590kWh	2600kWh	2600kWh
Battery Voltage Range	957.6～1231.2V	957.6～1231.2V	957.6～1231.2V	957.6～1231.2V
Nominal Power	2480kW	1245kW	830kW	625kW
General Data				
Dimensions of ESS (W×D×H)	9800×1700×2645mm	9800×1700×2645mm	9800×1700×2645mm	9800×1700×2645mm
Weight of ESS	28800kg	28800kg	28800kg	28800kg
Ingress Protection Rating	IP55	IP55	IP55	IP55
Operating Temperature Range	-30℃～+55℃【1】	-30℃～+55℃【1】	-30℃～+55℃【1】	-30℃～+55℃【1】
Relative Humidity	5%～100%	5%～100%	5%～100%	5%～100%
Max. Working Altitude	＜3000m【2】	＜3000m【2】	＜3000m【2】	＜3000m【2】
Cooling Concept	Liquid Cooling	Liquid Cooling	Liquid Cooling	Liquid Cooling
Noise	≤75dBA	≤75dBA	≤75dBA	≤75dBA
Fire Suppression System	Fire Alarm System	Fire Alarm System	Fire Alarm System	Fire Alarm System
Auxiliary Power Interface	AC480V/60Hz, 3-phase 4- wire	AC480V/60Hz, 3-phase 4- wire	AC480V/60Hz, 3-phase 4- wire	AC480V/60Hz, 3-phase 4- wire
Auxiliary System Peak Power Requirement @45℃	52.70kW	32.70kW	9.60kW	9.60kW
Communication Interfaces	Ethernet	Ethernet	Ethernet	Ethernet
Communication Protocols	Modbus TCP/IP	Modbus TCP/IP	Modbus TCP/IP	Modbus TCP/IP
Compliance	UL9540A	UL9540A	UL9540A	UL9540A
Standard Color	RAL9003/RAL6012	RAL9003/RAL6012	RAL9003/RAL6012	RAL9003/RAL6012

Note:

【1】Power derating is performed when ambient temperature is above 40℃.

【2】When the altitude is between 2000-3000m, the output of the system will be derated.

OSN-P100B274-E& OSN-P50B274-E

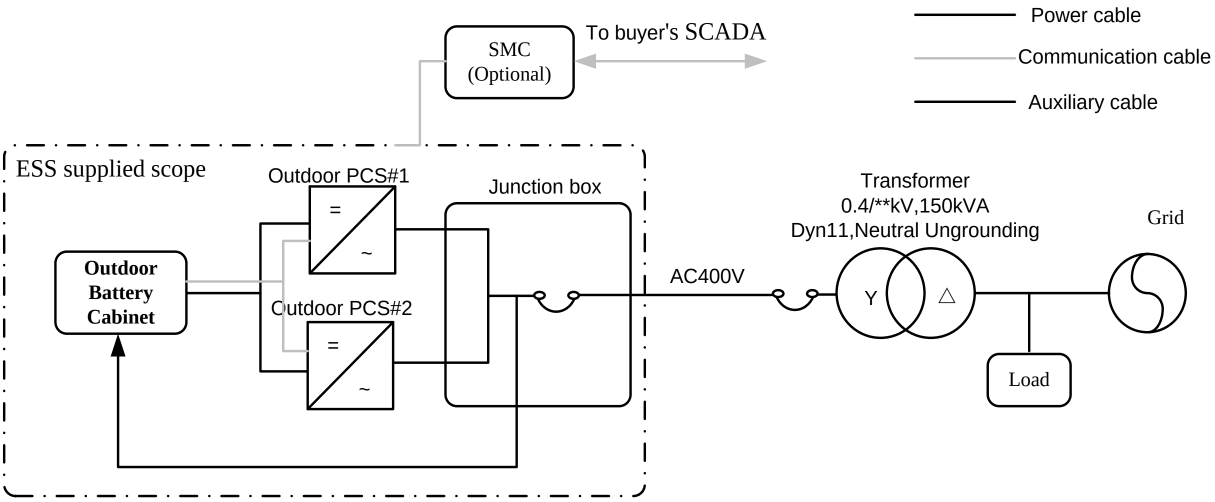
Battery Energy Storage System

System Features

- Advanced three-level technology, max. PCS efficiency 98%
- Bidirectional power conversion system with full four quadrant operation
- Wide DC voltage operation window
- Small current harmonic＜3% @nominal power
- Low transportation and installation cost, due to outdoor cabinet design
- Modular design , Easy for easy for transportation, installation and maintenance
- Typical applications: peak shaving, energy shifting, frequency regulation, capacity firming

Circuit Diagram

- OSN-P100B274-U ESS is equipped with 2 PCS, OSN-P50B274-U ESS is equipped with 1 PCS.



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System Parameter

System type	**100kVA-232kWh**	**50kVA-236kWh**
DC Data		
Cell type	LFP C15H	LFP C15H
Module type	1P9S	1P9S
Rack size	1P252S (28 modules)	1P252S (28 modules)
Configure of system	1 ×1P252S	1 ×1P252S
DC usable energy (BOL)@FAT	240kWh	240kWh
Battery voltage range	705.6～907.2V	705.6～907.2V
BMS comm. interfaces	Ethernet	Ethernet
BMS comm. protocols	Modbus TCP/IP	Modbus TCP/IP
AC Data		
Nominal power	100kVA	50kVA
AC usable energy (BOL)@FAT	232kWh	236kWh
Nominal voltage	400V	400V
Voltage range	360～440V	360～440V
Nominal grid frequency	50Hz	50Hz
Grid frequency range	47～52Hz	47～52Hz
Power factor	1 lagging～1 leading	1 lagging～1 leading
Max. THD of current	＜3% (@nominal power)	＜3% (@nominal power)
DC component	＜0.5% (@nominal power)	＜0.5% (@nominal power)
Isolation method	Transformer-less	Transformer-less
General Data		
Dimensions of ESS unit (W*D*H)	Around 1690×1900×2300	Around 1690×1720×2300
Weight of ESS unit	About 3110kg	About 2970kg
IP rating of PCS cabinet	IP65	IP65
IP rating of battery cabinet	IP55	IP55
Operating temperature range	-20℃～+55℃【1】	-20℃～+55℃【1】
Relative humidity	5%～100%	5%～100%
Max. working altitude	＜3000m【2】	＜3000m【2】
Cooling concept of PCS cabinet	Forced air cooling	Forced air cooling
Cooling concept of battery cabinet	Heating, Ventilation and Air Conditioning	Heating, Ventilation and Air Conditioning
Noise	≤75dBA	≤75dBA
Fire suppression system of battery cabinet	FM200 extinguishment system	FM200 extinguishment system
Communication interfaces	Ethernet	Ethernet
Communication protocols	Modbus TCP/IP	Modbus TCP/IP
Standard color	RAL9003	RAL9003
Compliance(on going)	G99	G99

Annotation：

【1】Power de-rating when environment temperature exceeding 40℃

【2】When the altitude is between 2000-3000m, the output of the system will be derated.

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FM48100-TIE1

FM48100-TIE1是由弗迪磷酸铁锂电池组成的电池模块，针对19寸标准机柜设计，高度为3U。主要用于通信备电，调峰供电系统，储能系统，混合能源系统等。

长循环寿命，
体积小、重量轻，
安全环保，
满足无人值守的要求。
可应用于通信备电、储能系统、
混合能源系统。

FM48100-TIE1	
规格参数	
标称电压	51.2 V
工作电压范围	40~57.6V
宽度	482.6mm
高度	130mm
深度	400mm
输出端子规格	M6
净重	39.5±0.5 kg
初始容量	≥100 Ah，25±3℃ at0.2C
标准充电电流	20 A
最大持续充电电流	100 A，At 25℃
标准放电电流	20 A
最大持续放电电流	100 A，At 25℃
放电直流内阻	≤20 mΩ，1.5C 30S, 25%SOC at 25℃
自放电	≤3%，25±3℃ 25%SOC 28 day
	≤5%，25±3℃ 25%SOC 90 day
充电温度范围	0~60℃
放电温度范围	-20~60℃
工作湿度范围	5%-95% RH
工作海拔	＜3000m
认证	IEC62619 /62368-1、UN38.3、EN300386-1、UL1642、UN38.3
IP等级	IP20

弗迪电池有限公司
深圳市坪山区坑梓街道坪山大道6531号
邮编：518122
电话:0755 8988 8888-55724

FM48100-TIE1

FM48100-TIE1 is a 48V100Ah battery module, is designed for 19 inch standard cabinet, and 3U height. The main applications are backup battery for communication, large capacity backup power supply, energy storage system, hybrid energy base station, etc.

LiFePO4 as cathode material
Excellent safety, long life time
High energy density
High operational reliability
Application: ESS, UPS, IDC

FinDreams Battery Company Limited
No.6531, Pingshan Road, Kengzi Street，Shenzhen, 518122, P.R.China
Postcode： 518122
TEL:0755 8988 8888-55724

FM48100-TIE1

Specification	
Nominal voltage	51.2 V
Operating voltage range	40~57.6V
Width	482.6mm
Height	130mm
Depth	400mm
Type of output terminal	M6
Net Weight:	39.5±0.5 kg
Initial capacity	≥100 Ah，25±3℃ 、0.2C
Standard charge current	20 A
Maximum charge current/continuous	100 A，At 25℃
Standard discharge current	20 A
Maximum discharge current/continuous	100 A，At 25℃
DCIR（discharge）	≤20 mΩ，1.5C 30S, 25%SOC at 25℃
Self-discharge	≤3%，25±3℃ 25%SOC 28 day
	≤5%，25±3℃ 25%SOC 90 day
Operating temperature range/charge	0~60℃
Operating temperature range/discharge	-20~60℃
Operating humidity	5%-95% RH
Operating altitude	< 3000m
Authentication	IEC62619 /62368-1、UN38.3、 EN300386-1、UL1642、UN38.3
IP	IP20

RESIDENTIAL ENERGY STORAGE SYSTEM

Powering You Day and Night

Contact us

FinDreams Battery Co., Ltd.
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Tel: +86-755-89888888 ext. 69399
Email: energy.pod@byd.com
www.byd.com

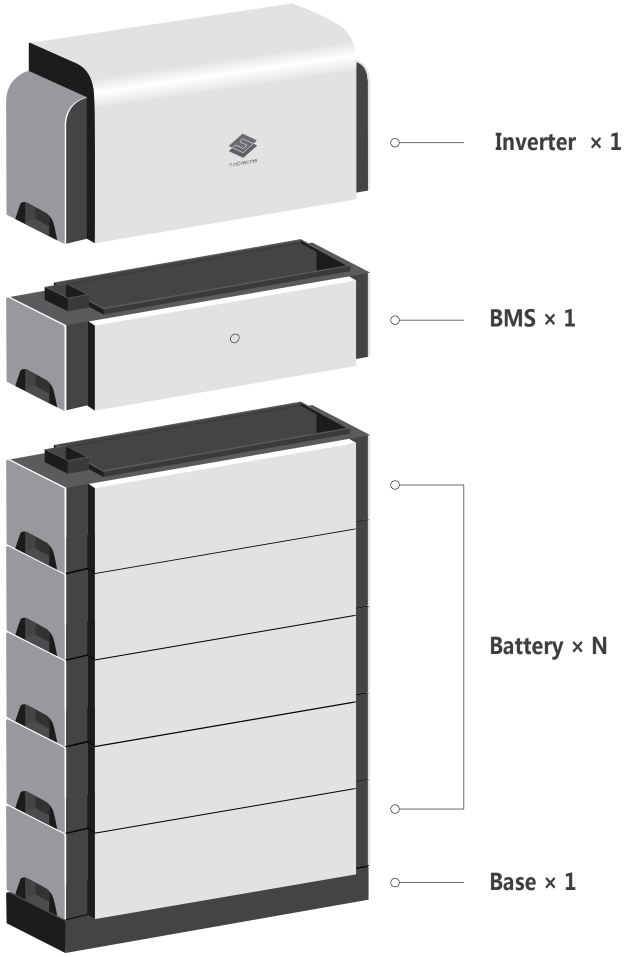
FinDreams ENERGY POD

Better Energy, Better Life

Features

Modularization
Easy installation

Safety and Reliability
Lithium iron phosphate battery



Network Monitoring
Any time, any where

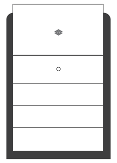
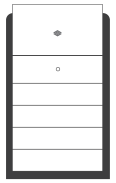
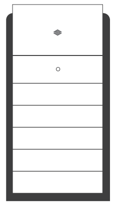
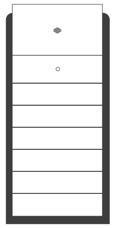
Long Lifetime
10 Years battery warranty

After-sales Service
24 Hours online

Monitoring Platform

1. Visual interface, real-time monitoring of product status
2. User data security
3. Remote software program upgrade, fault diagnosis
4. LAN Connection support

Specifications

Energy Pod				
Battery Capacity	7.2 kWh	9.6 kWh	12 kWh	14.4 kWh
Size (L × W ×H)	755 × 295 × 1155 mm / 2.48 × 0.97 × 3.79 inch	755 × 295 × 1325 mm / 2.48 × 0.97 × 4.35 inch	755 × 295 × 1495 mm / 2.48 × 0.97 × 4.90 inch	755 × 295 × 1665 mm / 2.48 × 0.97 × 5.46 inch
Weight	146 kg	177 kg	208 kg	239 kg
Efficiency	96%			
DOD	90%			
On Grid	3kW / 4kW / 5kW, 230Vac / 50Hz			
Off Grid	NA	3kW / 4kW, 230Vac / 50Hz		
Battery	$LiFePO_4$ (Lithium iron phosphate)			
Certification & Safety Standard	TÜV VDE CE ✓ SAA			